

STATEWIDE INFORMATION TECHNOLOGY WHITE PAPER

White paper: **File and Print Direction**

Effective Date: **October 24, 2006**

Replaces and Supersedes: Not applicable.

I. Purpose

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This paper is provided for informational purposes only. Comments, questions and suggestion are welcome and may be directed to the contact information provided below.

II. Definition(s)

Refer to the [Statewide IT Policies and Standards Glossary](#) for a complete list of definitions.

III. Closing

For questions or comments on this white paper, e-mail ITpolicy@mt.gov, or, contact the Information Technology Services Division at:

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IV. Cross-Reference Guide

V. Administrative Use

| History Log | |
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WHITE PAPER

File and Print Direction

October 24, 2006



STATE OF MONTANA
Department of Administration
INFORMATION TECHNOLOGY SERVICES DIVISION



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C R E D I T S

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File and Print Direction

CURRENT SITUATION

Two products are currently approved by the State of Montana for providing enterprise (statewide) network file and print service: Novell NetWare and Microsoft Server. However, the State is approaching a crossroads where decisions must be taken to determine what file and print server products will be used by the State.

The present Novell NetWare file and print service product (NetWare) is near the end of its life cycle. Novell will officially drop support for the NetWare product in year 2015. Novell's replacement product is known as Open Enterprise Server (OES Linux). Although the NetWare product is very stable, its market share is dwindling. Novell projects third-party development and support for NetWare products will drop off dramatically in the next eighteen to 36 months.

The State is very dependent on NetWare products for file and print services. There are approximately 240 NetWare-based servers included in the State's eDirectory tree. State agencies will soon be faced with the challenges of trying to install and operate NetWare products on new hardware platforms with little or no available support for the necessary software drivers. We are already seeing fewer new hardware platforms from Dell, HP and IBM certified for the NetWare product.

What course of action will the State take to address these challenges?

Currently State agencies have a choice of running file and print services on either Novell NetWare-based or Microsoft Windows-based server products. Options for the future include:

1. No change: Continue using both NetWare and Windows products.
2. Continue with two file and print products, but replace NetWare with the OES Linux product.
3. Migrate to a single file and print product, either Windows or OES Linux.
4. Migrate to a third-party file and print server product.

Other issues affected by the choice of server products need to be considered:

1. Identity Management plays an important role.
2. Architecture issues need consideration.
3. Present desktop management utilities are directory-dependent upon the Novell product.

4. The ability to recruit and retain qualified people must be considered.

OPTION ONE: NO CHANGE

If the State of Montana continues to offer the NetWare product as an approved product until Novell officially stops supporting it, our associated hardware and software backup product choices will become more limited as time goes on. As the State has experienced, it is getting harder and harder to find qualified Network Administrators with NetWare experience. The State's technical staff would spend valuable time trying to find answers to issues on an obsolete product, with diminishing information resources.

The "no change" option is not considered cost effective.

OPTION TWO: CONTINUE WITH TWO OPERATING SYSTEMS, UPGRADE NETWARE TO OES LINUX

The State of Montana is licensed for use of OES Linux product under the current licensing agreement with Novell. Novell has taken what it believes to be the best business offerings from the Open Source community and packaged them as OES Linux. Novell provides full support for the underlying operating system and the bundled services. All patches and updates follow strict change management guidelines. Security patches are available through an automated process. OES Linux works with eDirectory.

Benefits

The State has existing expertise with both Novell and Microsoft operating systems and related products. The State also has support contracts with both companies.

Windows and OES Linux work with the two State-supported network directories.

Giving State agencies the option of operating OES Linux-based and/or Windows-based servers allows for flexibility: Linux and Windows can serve as application servers as well as file and print servers.

The upgrade from NetWare to the OES Linux product is relatively easy. Novell has ported the NetWare user management utilities and file system (NSS) to the OES Linux environment. The result is that network administrators will not need to learn a new method of user administration.

Costs/Limitations

Supporting two operating systems is more costly than supporting one. This is true today with Windows and NetWare, and will continue to be true with Windows

and OES Linux. Having multiple operating systems can also limit options for consolidation. (E.g. multiple agencies co-located at a single site may require more servers if different operating systems are used.)

Oracle has no plans on certifying their products on the OES Linux product. We anticipate that there will be more 3rd party vendor-integration issues with OES than with Windows due to Microsoft's larger market presence.

Network administrators will need training on the Linux software internals (i.e., the kernel). The training cost for a Linux fundamentals class in Helena, Montana, is \$1,195.00 per student.

OPTION THREE: MIGRATE TO A SINGLE FILE AND PRINT OPERATING SYSTEM

Migrating to a single file and print operating system provides a more consolidated IT architecture. It reduces the need for multiple products for related infrastructure such as directories, inventory, software management, auditing, etc. It would result in increased short-term costs during the migration but reduced long-term costs.

The option of offering only Microsoft Windows-based file and print service is a realistic possibility. We have the directory infrastructure in place (i.e., Active Directory). We own the appropriate Microsoft client access licenses (CALs). We would need to purchase Windows server licenses, costing approximately \$115,000 plus optionally \$29,000 for annual maintenance. This would be offset by elimination of \$220,000 in annual Novell maintenance charges. Tools to migrate from NetWare to Windows are available and would ease the transition. Many of the State agencies have the technical expertise onboard to support Windows. If we choose Windows-only products, we would need to provide a new desktop management solution.

Currently Novell's ZenWorks is the State of Montana approved software product for desktop management. ZenWorks will run on a Windows-based server but proper operation is dependent on access to Novell's eDirectory. Security patches are available through an automated process. The State has an existing support contract with Microsoft. Moving to a Windows-only file and print server product could be the first step in preparing for implementing the identity management function. Using Windows for file and print server product and replacing ZenWorks as the desktop management product would eliminate our need for eDirectory.

An OES Linux-only option would be similar to a Windows-only option. We have the infrastructure and licensing. Novell has provided migration utilities and full support. Our desktop management software, ZenWorks, is fully supported. We would need to re-train our Network Administrators.

OPTION FOUR: MIGRATE TO A DIFFERENT OPERATING SYSTEM

By migrating to a third-party product, the State would jettison its current investment in file and print server products, and implement a totally new product. There would need to be an investment in researching all possible operating systems available. We would need to conduct extensive testing to ensure the operating system would integrate with existing directories, applications and services. This option could prove to be very costly due to software licensing, data migration/conversion and staff retention.

This does not appear to be a very attractive option.

CONCLUSION

The State of Montana is at a crossroads; we know the **NetWare** product won't meet our future needs.

Option One: No change; lose support and stay with obsolete technology; lose qualified staff.

Option two: The **Windows and OES Linux** product combination offers agencies a choice of running the best operating system to meet their needs.

Option three: Migrating to a single file and print product, **Windows or OES Linux**. If Windows is chosen, we would be one step closer to getting a better handle on identity management by potentially eliminating one directory. OES Linux gives us an easy transition by allowing us to continue to use familiar user management tools.

Option four: Migrating to a different operating system product, will prove to be costly in research, testing and integration time, as well as expenditures in procurement, and training.

RECOMMENDATION

We recommend migrating to a Windows-only file and print standard. We have the expertise onboard to support the Windows product. We know we can attract technicians with Windows-based skills. Recruitment of highly skilled Linux support technicians would prove to be more of a challenge than recruiting Windows technicians. By approving only the Windows file and print server product we eliminate the greater of the two dependencies on eDirectory.

It doesn't make sense to manage a separate directory for desktop management. Other solutions are available that would allow us to eliminate that dependency as well.

A future issue is identity management. We have an opportunity to take a step toward getting us there. One of the first steps in identity management is to minimize the number of directories in the network environment. Of the two directories supporting the State's file and print environment, eDirectory has the least number of dependent services. By migrating file and print services to a Windows-only product and selecting a desktop management software product not dependent on eDirectory, the State could remove an entire directory.